REMARKS

The Office Action dated October 6, 2008 has been received and carefully studied.

The Examiner rejects claims 1-6 and 19 under 35 U.S.C. §103(a) as being unpatentable over Pemsler et al., U.S. Patent No. 4,592,973, in view of Applicant's admitted prior art. The Examiner states that Pemsler et al. discloses a separator comprising a microporous thermoplastic film such as polypropylene and a liquid phase including a polar solvent such as n-decanol and/or non-polar solvents such as toluene or kerosene. The Examiner admits that Pemsler et al. do not expressly teach that the thermoplastic has a molecular weight of at least 300,000, or the weight percentages of the components, but cites the disclosure in the present specification that ultra high molecular weight polyethylene having a weight of 5-7 x 106 is customarily used to produce separators. The Examiner concludes that it would have been obvious to use this polyethylene for the microporous polyethylene contemplated by Pemsler et al. The Examiner admits that Pemsler does not disclose the specific amounts of oil and additive set out in the instant claims, but considers the amounts of these components to be mere optimization and within the skill in the art.

The rejection is respectfully traversed.

The present invention relates to a battery separator based on thermoplastic, ultra-high molecular weight polyolefin comprising,

apart from polyolefin and optional filler, 5-35 wt.% oil and 0.5-5.0 wt.% of a compound according to Formula (I).

As set out in the original application, page 1 to page 6, line 22, it is an object of the invention to provide battery separators with high oxidation stability which are easy and inexpensive to produce and which are protected over their whole surface against oxidation. Oxidation is in particular a problem for lead acid batteries because of the presence of two highly oxidative species, namely, PbO_2 (lead in its oxidation stave IV) and $[O]_{nasc.}$ (oxygen in statu nascendi). As shown in the examples, see in particular Examples 1 (comparative) and 2-18, small amounts of 1-dodecanol (Examples 2 to 8), 1-tetradecanol, 1-hexadecanol and 1-octadecanol (Examples 9-11), and fatty alcohol ethoxylates (Examples 15-18), which fall under Formula (I), with n=1 and m=0, show excellent protection when applied to separator materials.

In contrast thereto, Pemsler relates to a supported liquid membrane separator consisting of a microporous membrane and a liquid transport medium or agent (column 1, lines 15-20). The liquid transport medium or agent in turn consists of an organic ionic transporting liquid and solvent, which are both substantially insoluble in the electrolyte. As set out in column 6, lines 3-25 as well as column 9, lines 48-50, the transport agent (i) is dissolved in (ii) a suitable solvent modifier. The solvent modifier must show solubility for the transport agent, low solubility in the electrolyte and be polar. Examples in Pemsler

for the modifier are n-decanol (10 carbon atoms) as well as kerosene. The effect achieved by the addition of the modifier is OH^- transport as well as low resistance of the separator (compare column 12, lines 1-10 and 34-38 of Pemsler). Pemsler suggests to use rather large amounts of modifier.

Lead acid batteries are not disclosed or rendered obvious by Pemsler. According to column 1, line 22 as well as claim 11 of Pemsler, the separator disclosed there may be used in an alkaline battery. Since highly oxidative species such as Pb(IV) and $[O]_{nasc.}$ are not found in such applications, alkaline batteries to a much lesser degree suffer from oxidation of the separator material.

In other words, Pemsler specifically relates to (i) alkaline batteries, is (ii) silent on any oxidation issues and suggests to use (iii) large amounts of "modifier" such a n-decanol or kerosene to effect (iv) OH^- transport and result in low resistance of the separator. In contrast thereto, according to the present invention, (1) small amounts of additives surprisingly can be used so as to overcome (2) oxidation problems observed in separators of (3) lead acid batteries.

Therefore, even if one were, for the sake of argument, to combine Pemsler with Applicant's admitted prior art, one would not arrive at the claimed invention, which uses <u>small</u> amounts of the additives of Formula (I) to overcome an oxidation problem.

Moreover, there is no indication in Pemsler that the amount

of the components is result effective for high oxidation stability. Indeed, as stated above, oxidation stability is not a problem in Pemsler. A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. See *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Further still, there is no suggestion in Pemsler that using the small amounts of the compounds which fall under Formula (I) would result in the surprising and unexpectedly high oxidation stability of the separators, as shown in the aforementioned Examples.

New claims 22 and 23 have been added to further define the invention. Support for the new claims can be found on page 8 of the specification, for example. It is noted that Pemsler does not disclose or suggest battery separators having compounds of Formula (I) wherein R is a hydrocarbon radical with 12 to 75 carbon atoms, or 14 to 40 carbon atoms.

Reconsideration and allowance are respectfully requested in view of the foregoing.

Respectfully submitted,

Kevin S. Lemack
Reg. No. 32,579
176 E. Main Street - Suite 5
Westboro, Massachusetts 01581
TEL: (508) 898-1818